

A manufacturer of kitchen appliances has a daily production cost of $C = 650 - 20x + .20x^2$, where " C " is the total cost (in dollars) and " x " is the number of appliances produced.

- a) How many appliances should be produced each day to yield a minimum cost?

vertex $C = 650 - 20x + .20x^2$
 $C = .20x^2 - 20x + 650$ $-\frac{b}{2a} = \frac{20}{2(.20)}$

Fifty appliances should be produced to yield a minimum cost.

- b) What is the minimum cost?

vertex $C = y$
 $650 - 20(50) + .20(50)^2 = \150.00
 The minimum cost is \$150.00

6. Jenna's bedroom has an area of 160 square feet. The length is 6 feet longer than the width. Find the dimensions of the room.

Answer: _____

7. The height y (in feet) of a ball thrown by a child is $y = -\frac{1}{12}x^2 + 2x + 4$ where x is the horizontal distance (in feet) from where the ball is thrown.

- a) How high is the ball when it leaves the child's hand? $x = 0$

$y = -\frac{1}{12}(0)^2 + 2(0) + 4 = 4 \text{ ft.}$

Answer: The ball is 4 feet high when it leaves the child's hand.

- b) How high is the ball when it is at its maximum height?

vertex $y = -\frac{1}{12}x^2 + 2x + 4$ $-\frac{b}{2a} = \frac{-2}{2(-1/12)} = 12$
 $-\frac{1}{12}(12)^2 + 2(12) + 4 = 16 \text{ ft.}$

Answer: The maximum height is 16 ft.

- c) How far from the child does the ball strike the ground?

$0 = -\frac{1}{12}x^2 + 2x + 4$ $x \text{ intercepts}$
 $\frac{-2 \pm \sqrt{2^2 - 4(-1/12)(4)}}{2(-1/12)} = \frac{-2 \pm \sqrt{16/3}}{(-1/6)}$

Answer: The child threw the ball 25.86 ft or 26 ft

